The most important of his published work in genetics deals with wheat, but he also carried on a long series of dog-breeding experiments and, through the firm, made possible the researches of Hagedoorn, Meunissier, Mottet and other geneticists. He was largely responsible for the Fourth International Conference on Genetics, held in Paris in 1911. As secretary, he did most of the work connected with it; as financial guarantor, he furnished most of the funds needed for it. The large volume of *Proceedings,* which he edited and published at his own expense, is a fitting memorial to his zeal in the promotion of scientific research.

PAUL POPENOE

WASHINGTON, D. C.

## SCIENTIFIC EVENTS

### THE PRODUCTION OF IRON ORE AND PIG IRON IN 1916

THE iron ore mined in the United States in 1916 reached a total of 75,167,672 gross tons, the greatest annual output ever made. The shipments from the mines in 1916 were 77,870,553 gross tons, valued at $181,902,277. The quantity mined in 1916 was more than 19,600,000 tons greater than that mined in 1915. The increases in quantity and in value of iron ore shipped in 1916 amounted to about 40 and 80 per cent., respectively. The average value per ton at the mines in 1916 was $2.34, as against $1.83 in 1915. These figures, which were compiled under the direction of E. F. Burchard, of the United States Geological Survey, Department of the Interior, include for 1916 only iron ore containing less than 5 per cent. of manganese.

Iron ore was mined in 24 states in 1916 and 23 in 1915. Minnesota, Michigan and Alabama, which have for many years produced the largest quantities of iron ore, occupied in 1916 their accustomed places.

The Lake Superior district mined nearly 85 per cent. of the total ore in 1916 and the Birmingham district about 8 per cent. No other district except the Adirondack mined as much as 1,000,000 tons. The increase in production in 1916 was especially marked in the Adirondack and Chattanooga districts—54 and 55 per cent. respectively—but every district showed an increased output over that of 1915.

All the ranges in the Lake Superior district mined a larger quantity of iron ore in 1916 than in 1915, and the largest increases were in the Gogebic and Menominee ranges—54 and 43 per cent., respectively. The output of the Cuyuna range exceeded 1,500,000 tons for the first time.

There were 12 mines in the United States that produced more than 1,000,000 tons of iron ore each in 1916, five more than in 1915. First place in 1916 was held by the Hull-Rust mine, at Hibbing, Minn.; second place by the Red Mountain group, near Bessemer, Ala.; third place by the Fayal mine, at Eveleth, Minn., and fourth place by the Mahoning mine, at Hibbing, Minn. The production of these mines in 1916 was, respectively, 7,658,201, 2,899,588, 2,252,008 and 2,215,788 tons. The increase at the Hull-Rust was 232 per cent., making the production of this one mine more than one tenth of all the ore mined in the United States in 1916. These records illustrate the rapidity with which the rate of output of mines in the Lake Superior district may be increased. None but open-pit mines could be made to respond to demand to such a degree.

The production of pig iron, including ferro-alloys, was 39,434,797 gross tons in 1916, compared with 29,916,213 gross tons in 1915, an increase of 32 per cent., according to figures published by the American Iron and Steel Institute, February 24, 1917. The pig iron, exclusive of ferro-alloys, sold or used in 1915, according to reports of producers to the United States Geological Survey, amounted to 39,126,324 gross tons, valued at $663,478,118, compared with 30,384,486 gross tons, valued at $401,409,604 in 1915, a gain of 29 per cent. in quantity and 65 per cent. in value. The average price per ton at furnaces in 1916 as reported to the Survey was $16.96, compared with $13.21 in 1915, an increase of 28 per cent.

### RESEARCH IN AERONAUTICS

THE report of the British Advisory Committee for Aeronautics for 1916–17 is sum-

marized in the Engineering Supplement of the London *Times*.

It is said that owing to the numerous changes and development in the design and construction of aircraft an increasing number of special problems constantly presented themselves for investigation, and these have closely occupied the attention of the staffs engaged in experimental work at both the National Physical Laboratory and the Royal Aircraft Factory. In addition to aerodynamical research, much attention has been given to questions relating to engines, materials of construction, strength of construction and design, instruments and accessories, as well as to methods of attack of aircraft from aircraft and other matters.

In the new 7 ft. air channel at the National Physical Laboratory an air speed of 85 ft. per second can be reached with an expenditure of 160 h.p. It is doubtful whether further increase in size of channel or speed of air current would advance existing knowledge to an extent sufficient to outweigh the greatly increased cost and other disadvantages involved. Should it prove necessary to conduct experiments on a larger scale and at higher speeds, it would appear necessary to employ a method in which the model is moved through the air. This procedure presents various difficulties, and the securing of even moderately accurate data in this manner is at the best extremely laborious. Probably the least troublesome way of applying this method is by installing measuring apparatus on the aeroplane itself, and it seems probable that only in this way can an accurate comparison be obtained between model and full-scale conditions.

Improved methods of supporting the models under test have been devised for use in special cases. The effect on the measured resistance of the method of holding the model is often surprisingly large, and without the necessary care and experience in avoiding effects due to interference with the air flow very large errors may result. In general the difficulty is greatest in measurements on forms of small head resistance—*e. g.,* aeroplane bodies and airship envelopes. Probably little reliance can be placed on the absolute values obtained in earlier measurements on airship models of stream line shape, which were made to determine the form of least resistance, and were in the main comparative. With the new methods of support the possible error has been greatly reduced, and when full-scale values have been determined with accuracy the prediction of full-scale resistance from the models will be established on a satisfactory basis.

At the Royal Aircraft Factory the measurement of the resistance of aeroplanes in flight has been continued with the object of confirming the model experiments, and an instrument for measuring the resistance directly has been developed. The distribution of pressure over the wing of an aeroplane in flight has been measured, and further experiments on these lines are in progress. Experiments and also much theoretical work have been carried out on the longitudinal and lateral stability of aeroplanes in flight. Measurements have also been made of the disturbance of the air behind a propeller, to obtain data required in the design of new machines.

## SCIENTIFIC NOTES AND NEWS

PRESIDENT RAYMOND A. PEARSON, of the Iowa State College, and Clarence Ousley, of the Texas State College, have been appointed to be assistant secretaries of agriculture.

DR. RAY L. WILBUR, president of Stanford University and formerly professor of medicine, has been placed in charge of the conservation department of the Food Administration.

THE Women's Council of Defense announces the following advisory committees: *Food Utilization.*—Professor R. H. Chittenden, Professor Graham Lusk, Professor E. V. McCollum, Professor L. B. Mendel, Dr. C. L. Alsburg, Dr. C. F. Langworthy, Professor Vernon Kellogg, Dr. A. E. Taylor and President Ray L. Wilbur. *Public Health.*—Professor W. H. Welch, chairman, Dr. L. P. Ayer, Dr. Hermann M. Biggs, Dr. D. L. Edsall, Dr. Cary T. Grayson, Dr. A. W. Hewlett, Dr. A. C. Janeway, Dr. F. G. Novy, Dr. R. M. Pearce and Professor H. G. Wells.

DR. HARRIET L. HARTLEY has been appointed chief of the division of child hygiene,